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Procedia Social and Behavioral Sciences 23 (2011) 75–77

Procedia Social and Behavioral Sciences

Academy of Aphasia 2011

Effects of Phonological Complexity Training on Pseudoword Reading in Acquired Phonological Dyslexia

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Introduction

Sonority, the relative measure of intensity related to openness of the vocal tract (Clements, 1990), is one variable of phonological complexity investigated in aphasic error production (Romani & Galluzzi, 2005) and training phoneme production in children with phonological disorders (Gierut, 1999). These studies investigated sonority patterns in the context of the Sonority Dispersion Principle (SDP), a principle relating to the distribution of sonority across a syllable (Clements, 1990). In studies of error production, participants demonstrated lower accuracy for syllables with "complex" sonority profiles and a tendency to change "complex" syllables into "simple" syllables with respect to sonority (Romani & Galluzzi, 2005). Further, in training studies with children, when "complex" consonant clusters were trained, improvement on trained clusters and generalization to "simple" consonant clusters was noted, but training "simple" clusters did not result in generalization (Gierut, 1999). To date, no treatment studies have systematically manipulated sonority in order to improve reading ability in acquired dyslexia. In the present study, we applied principles of phonological complexity to the training of letter-to-sound reading in acquired phonological dyslexia.

Methods

Five individuals with acquired phonological dyslexia participated in a training experiment using phonological complexity as a training variable. This experiment used a single-subject, multiple baseline design across behaviors. For each participant, two consonant clusters were selected for training, one cluster representing a "complex" onset (e.g., /fl/) and the other representing a "simple" onset (e.g., /kl/) as predicted by the SDP. Three participants were trained on the "complex" cluster and two were trained first on the "simple" cluster, while tracking oral reading accuracy of both onsets. Training involved a combination of letter-sound correspondence and phonological skill instruction. Consonant cluster oral reading accuracy of training and generalization items was measured with weekly probes administered before every other training session. Participants were trained to a criterion of 80% correct over two consecutive probe sessions on trained items.

Results & Discussion

As predicted based on previous studies, participants who received training in the "complex" condition demonstrated improved ability to orally read words with the trained cluster onset as well as generalization to words with the untrained, "simple" onset (Figure 1A). Conversely, participants who received training in the "simple" condition demonstrated significant improvement for the trained onset but no generalization to the "complex" onset (Figure 1B). The present findings suggest phonological complexity can be used to improve

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doi:10.1016/j.sbspro.2011.09.177

generalization to untrained phonologically related words in acquired phonological dyslexia.

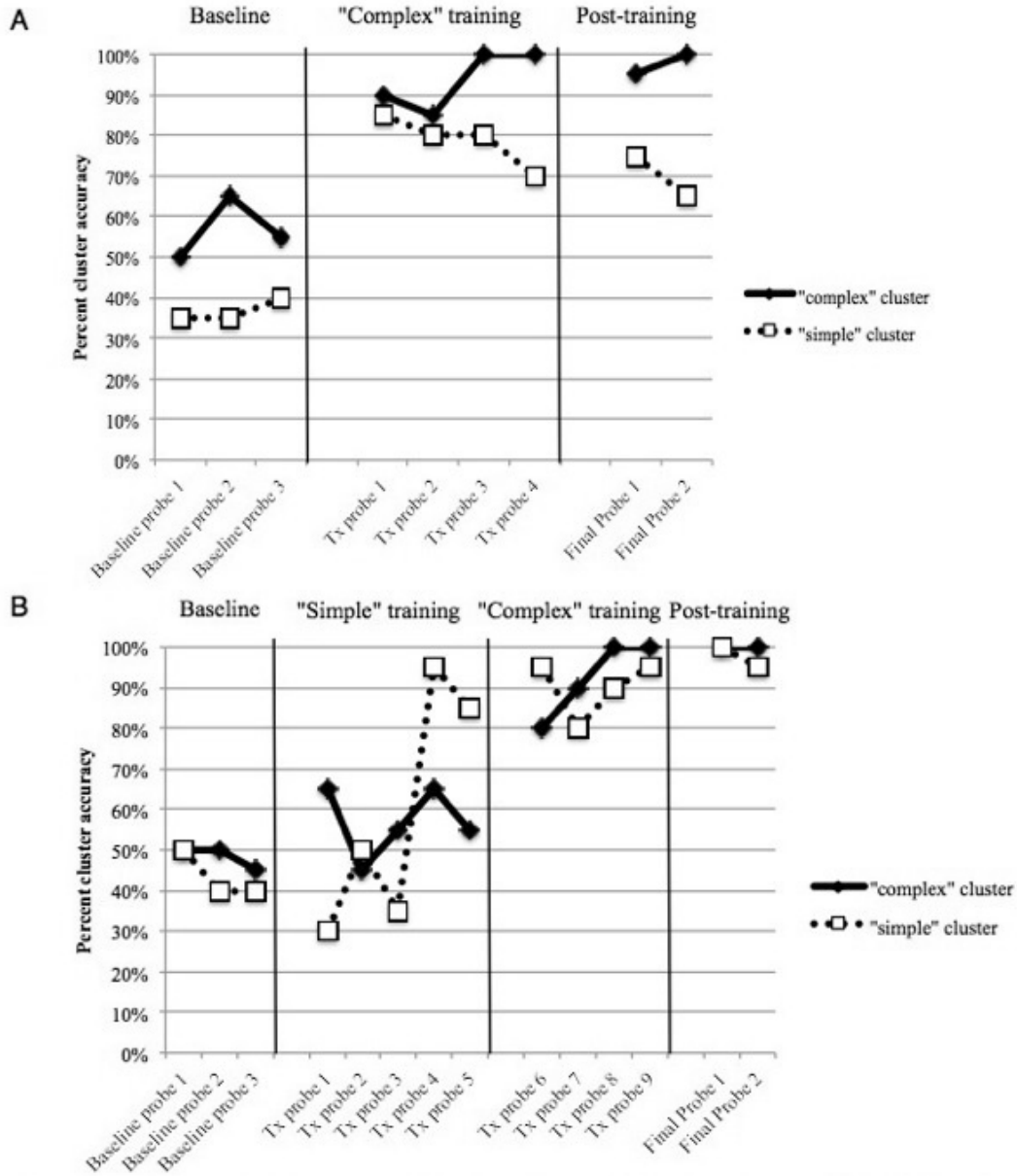

Figure 1. Oral reading accuracy of pseudowords with "complex" versus "simple" initial consonant clusters for an example of a participant who received training on a "complex" consonant cluster (A) and an example of a participant who first received training on a "simple" consonant cluster (B).

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